The Influence of Textese on Adolescents' Perceptions of Message Writers

Jessica Graham

A report submitted as a partial requirement for the degree of Bachelor of Psychology with Honours at the University of Tasmania, 2017

Division of Psychology, School of Medicine

University of Tasmania

Statement of Sources

I declare that this report is my own original work and that the contributions of others have been duly acknowledged.

Signature: …….. Date: ……..

Acknowledgements

Firstly, I would like to thank both Dr Nenagh Kemp and Dr Rachel Grieve for their extraordinary supervision and contributions throughout the year. I am extremely grateful for their valuable guidance and expertise, as well as their words of encouragement to help me get to this point.

I would like to acknowledge the schools involved in my study, especially the students who participated, and the teachers who gave up their class time to support my research. The cooperation and enthusiasm of all involved really made my Honours experience a positive one, and I am thankful for the opportunity to have worked with these schools.

To Mum, Dad, and Nicki, who provided me with love, hugs, support, and (of course) chocolate. Thank you so much for your help when I needed it, and for believing in me to make it through the year! Also to Bella, I am thankful for your constant support and for keeping me grounded.

Finally, I would like to thank all of the Honours students and friends who have helped to make this year enjoyable and fun. I would especially like to thank Kelsey, Chloe, Anna, Lucy, and Georgia, for always being there for me, especially during all of the stressful times. Thank you for all of your support, love, and reassurance, and for inspiring me to do my best.

Table of Contents

Abstract 1

Introduction 2

The Current Study 12

Method 14

Participants 14

Design 14

Procedure and Materials 15

Digital communication questionnaire 15

Message response task 15

Pilot study 17

Results 23

Preliminary Data Screening 23

Digital Communication Questionnaire 24

Message Response Task 25

Discussion 36

Limitations and Recommendations 41

Implications and Additional Directions for Future Research 43

Conclusion 45

References 46

Appendices 52

A: UTAS Human Research Ethics Committee Approval 52

B: Catholic Education Office Approval 53

C: Participant Information Sheets and Consent Forms 54

D: Digital Communication Questionnaire 61

E: Message Response Task Presented Messages 63

List of Tables and Figures

Figure 1. Example pilot message written in Standard English 18

Table 1. Example of the Three Textese Density Message Versions 20

Figure 2. Example text message written to a teacher in high textese 21

Figure 3. Example email message written to a friend in medium textese 22

Figure 4. Means and standard errors for the estimated frequency of sending and receiving messages 25

Table 2. Mean Ratings for the Main Effects of Textese Density, Recipient Status, and Modality 27

Figure 5. Means and 95% CIs for perceptions of appropriateness of writing style, for the interaction between textese density and recipient (left), the interaction between textese density and modality (centre), and the interaction between modality and recipient (right), all significant 29

Figure 6. Means and 95% CIs for perceptions of intelligence, for the significant interaction between textese density and recipient (left), the significant interaction between textese density and modality (centre), and the non-significant interaction between modality and recipient (right) 31

Figure 7. Means and 95% CIs for perceptions of friendliness, for the significant interaction between textese density and recipient (left), the interaction between textese density and modality (centre), and the interaction between modality and recipient (right), both non-significant 33

Figure 8. Means and 95% CIs for perceptions of attention to detail, for the significant interaction between textese density and recipient (left), the non-significant interaction between textese density and modality (centre), and the significant interaction between modality and recipient (right) 35

The Influence of Textese on Adolescents' Perceptions of Message Writers

Jessica Graham

Word Count: 9, 998

Abstract

Text messages are characterised by an abbreviated, casual language style, known as textese (e.g., *c u on thurs* ☺). This study investigated the perceptions adolescents formed in response to the use of different levels of textese in digital messages, which varied in their communication modality (text, email) and their intended recipient (friend, teacher). Grade 8 participants (N = 92) read 12 fictitious messages, and rated how much they agreed (on a 7-point Likert scale) that the message writers had an appropriate writing style, were intelligent, friendly, and paid attention to detail. Participants rated the message writers less favourably when messages included high levels of textese to teachers compared to friends. Further, participants rated the message writers more favourably when they used no textese in email compared to text messages. However, they rated message writers similarly when they used medium and high levels of textese in text and email messages, which was unexpected. The limitations of this study include the experimental text messages lacking ecological validity due to their length, and potential demand characteristics. This research highlights that adolescents are sensitive to the recipients of digital messages, but may not be as sensitive to different communication modalities, when considering language choices.

Mobile phones are central to the world of digital communication. In Australia, there are currently subscriptions for approximately 26.3 million mobile phones (Australian Bureau of Statistics, 2017). Over recent years, smartphone ownership has increased in popularity, and it is estimated that 76% of Australian adults own a smartphone device (Australian Communications and Media Authority, 2016). Text messaging is one of the most commonly used features on a smartphone, although communication through social networks is becoming increasingly popular for younger age groups (Deloitte, 2015). In 2017, it is expected that 7.8 trillion text messages will be sent worldwide, which equates to approximately 23 billion messages sent each day (Portio Research, 2014). Building on extant research regarding the perceived appropriateness of digital writing style (e.g. Drouin & Davis, 2009; Grace, Kemp, Martin, & Parrila, 2015; Kemp & Clayton, 2016), and because writing style in digital communication can affect the perceptions people form about others (e.g., Lewandowski & Harrington, 2006; Vignovic & Thompson, 2010), the aim of the current study was to investigate for the first time whether adolescents form different perceptions about the senders of text messages as a function of message modality, recipient type, and language style used.

The Language of Text Messaging

A recent report by Nielsen (2017) found that 45% of children own a mobile phone by the age of 10 to 12 years, with text messaging being one of their top activities. In Australia, nine out of 10 adolescents, aged 14 to 17 years old, own a mobile phone (Roy Morgan Research, 2016). These statistics mirror those of American adolescents, aged 13 to 17 years old (Lenhart et al., 2015a), who send an average of 30 messages per day. For adolescents, text messaging is considered one of

the most important ways of communicating and staying in touch with friends (Lenhart, Smith, Anderson, Duggan, & Perrin, 2015b).

The abbreviated and casual written language style of text messages is referred to as 'textese' (Drouin & Driver, 2014). Textese gained popularity when text messages were restricted to 160 characters in length (Rosen, Chang, Erwin, Carrier, & Cheever, 2010). Early phone models had multi-press keypads and small screens, therefore, textese were originally used to overcome these technological limitations, saving time, effort, and space when typing. In using textese, message writers were able to condense the length of their message, while still conveying the message content and meaning (Crystal, 2008). The abbreviations, respellings and symbols associated with this style of writing are referred to as 'textisms' (De Jonge & Kemp, 2012). Textisms include the shortening of words (e.g., *thurs* instead of *Thursday*), insertion of initialisms (e.g., *OMG* instead of *Oh my god*), the deletion of capital letters and apostrophes (e.g., *ive* instead of *I've*), accent stylisation (e.g. *gonna* instead of *going to*), as well as emoticons to help express emotions (e.g., ☺) (De Jonge & Kemp, 2012; Rosen et al., 2010).

Advances in phone technology have helped to overcome the restrictions imposed by earlier model mobile phones, and consequently are linked to changes in textism use and textism type over time (Kemp & Grace, 2017). For example, predictive text-entry systems, which predict words based on the frequency estimations of the mobile device's dictionary, reduce the time and effort of typing (Drouin & Driver, 2014). Additionally, the availability of Qwerty touch-screen phones means that typing is much less restrictive than previously, and there is less need to abbreviate words (Kemp & Grace, 2017). However, textism use has continued to remain popular. Within undergraduate student populations, the

proportion of textese (termed ‘textese density’) in text messages has been found to vary from 20% (Kemp, Wood, & Waldron, 2014), to 25% (Lyddy, Farina, Hanney, Farrell, & O'Neill, 2014), to 28% (Drouin & Driver, 2014). In a recent study of seven consecutive Australian undergraduate cohorts, the use of textese gradually declined from 2009 to 2015, but remained at approximately 12% of message words during the last two years of this time period (Kemp & Grace, 2017). In the text messages collected from these undergraduate students, Kemp and Grace (2017) observed frequent omissions of capitals and increased use of emoticon and expressive (extra characters added to emphasise meaning e.g., *whyyyyy*) textisms, while the use of homophones and shortenings declined in popularity. These observations were linked to the increased ownership of Qwerty keyboards and use of predictive text-entry over the time period. The omission of capital letters is a finding common to previous naturalistic (real-life observations) research, where this type of textism has become an accepted feature of digital communication (De Jonge & Kemp, 2012; Lyddy et al., 2014).

Textism use varies with age. Adolescents aged 13 to 15 years old have been found to write 13-16% of their messages in textisms, when asked to translate Standard English sentences into texts that they would send to a friend (De Jonge & Kemp, 2012). Contrasting these findings, in naturalistic messages collected from 11 to 15-year-olds, up to 40% of these messages were written in textese (Kemp et al., 2014). More recently, grade 6 to 8 students were found to use more textisms in their experimentally elicited message responses than students in grades 11 to 12 (Crowe, 2014). It is acknowledged that adolescents have very similar texting behaviours to those of undergraduate students, specifically in relation to the types of textisms used (De Jonge & Kemp, 2012).

The prevalence of textese in adolescents' messages today suggests that its use is attributed to reasons beyond just overcoming previous technological limitations of mobile phones. Textese is considered a more creative writing style, as it is not restricted to the traditional conventions of Standard English, used in formal and academic settings. Therefore, for adolescents today, the use of textese in text messages is a way for them to express autonomy in their writing, and to demonstrate creativity with their language choices (Turner, Abrams, Katic, & Donovan, 2014). Further to this, Kemp et al. (2014) suggested that high textese densities in adolescents' messages reflect their experimentation with writing styles and their development of social identity. More specifically, adolescents have reported that they repeat vowels or consonants in an attempt to be more expressive and to introduce their voice into digital conversations. For example, writing *'sooooo bad'* to put emphasis on the meaning of this phrase (Turner et al., 2014). Furthermore, emoticons are commonly used in digital communication in order to add emotive meaning into a message (Lewis & Fabos, 2005), and can compensate for the lack of nonverbal cues in digital messages, such as helping to express facial expressions and gestures (Kaye, Malone, & Wall, 2017).

The changing nature of textese over time suggests that textese still plays an important role in the language of digital communication, especially for adolescents, where textisms in their text messages have social, creative and expressive purposes (e.g., Kemp et al., 2014; Turner et al., 2014). Therefore, it is important for research to continue to examine textese, and particularly how textese may affect adolescents' perceptions of others, considering the central role of text messaging as a means of communication in the world today.

Textisms: Their Use in Different Contexts and for Different People

Textisms are not unique to text messages, and are used across different modalities of digital communication, such as email and social networking (Drouin & Davis, 2009). Importantly, research has shown that textism use is not uniform across different modalities of communication, or across different message recipients. Specifically, when undergraduates provided examples of messages they had recently sent, it was found that their textism use decreased across the modalities of text messages, Facebook posts, and emails; and decreased across the recipients of friends, peers, and superiors (Kemp & Clayton, 2016). When these participants were asked to compose messages in different communication modalities, and to different recipients, they also used fewer textisms in emails compared to text messages and Facebook posts, and used fewer textisms when writing to superiors than to peers, and to peers than to friends. However, Kemp and Clayton (2016) did observe participants including some textisms when writing to more superior recipients, such as lecturers or employers, although they used significantly fewer compared to with friends. Kemp and Clayton's (2016) findings were line with those of Drouin and Davis (2009), whose undergraduate sample used significantly more textisms in emails to friends, than lecturers, in an experimental exercise.

Undergraduate students' pattern of textism use across communication modalities and message recipients also coincides with their ratings of textism appropriateness. Grace et al. (2015) asked undergraduates to rate how appropriate they thought it was to use textisms in a variety of modalities, including text messages, emails, and university work, and to various recipients, including friends, family, lecturers, and strangers. Participants reported that the use of textisms was less appropriate in more formal contexts, and for more socially distant recipients. Kemp

and Clayton's (2016) undergraduate participants viewed actual messages addressed to different recipients, and written in different communication modalities, that varied in their textese density. Participants then rated how appropriate they thought the message was for its recipient. Similar to the findings of Grace et al. (2015), participants rated messages written with high and medium textese densities (proportion of textisms was 60-70%, and 20-30%, respectively) to be more appropriate for friends, than to peers, than to lecturers, where this pattern was most evident for messages with a high level of textese. The opposite finding was found for messages that contained no textisms (Kemp & Clayton, 2016). Previous research has also found undergraduates to consider textisms as inappropriate to use in more formally written communication, such as an email to a lecturer (Drouin & Davis, 2009).

Currently, research with adolescents is largely a result of informal questioning and surveys. A Pew survey found that 64% of adolescents, aged 12 to 17, admitted to using textese occasionally in their schoolwork (Lenhart, Arafeh, Smith, & Macgill, 2008). However, informal questioning has found children to consider the use of textese in their schoolwork as 'ludicrous' (Plester, Wood, & Joshi, 2009, p.157), which demonstrated that even from a young age, children are able to distinguish the appropriateness of their use of textese. Similarly, when questioned, adolescents viewed the use of abbreviations in schoolwork and in student-teacher communication as unacceptable, although some admitted that they occasionally used abbreviated language in academic work (Turner et al., 2014).

Further to this, adolescents, like young adults, are sensitive to the context and audience of their messages, when using particular styles of language (Turner et al., 2014). When interviewed, they noted that they modified their language in digital

communication, depending on their perceptions of their recipient's authority. For example, when writing to a teacher, they were likely to write according to the conventions of Standard English and used capital letters and commas, which was not seen as necessary when communicating with friends (Turner et al., 2014). In addition to the influence of the message recipient on adolescents' language choices, Turner et al. (2014) also reported that adolescents adjusted their writing style according to the mode of communication (e.g., Facebook, email, text message).

Taken together, the research examining undergraduates' textism use and their perceptions of appropriateness of textism use (e.g. Drouin & Davis, 2009; Grace et al., 2015; Kemp & Clayton, 2016), suggests that the use of textese is generally not considered appropriate in more formal modes of communication, such as emails, or when communicating with more socially superior people, such as lecturers. Additionally, undergraduates also vary their use of textese in their actual and experimentally elicited messages in a way that supports their views on appropriateness (Kemp & Clayton, 2016). While the research by Kemp and Clayton (2016) experimentally manipulated the textese density of messages, thus gaining a more detailed understanding of undergraduates' views of textism appropriateness, other research (e.g., Drouin & Davis, 2009; Grace et al., 2015) has only asked participants about their thoughts on the appropriateness of textisms more generally. It is important to use experimental methodology, such as systematically varying the level of textese density, modality, and recipient of messages, in order to more clearly understand when a message containing textisms is no longer considered appropriate. Furthermore, while research by Turner et al. (2014) highlights that adolescents, like undergraduates, make purposeful choices when writing in different contexts and to different people, there has been little experimental research with adolescents

investigating whether this awareness of writing style actually affects how they respond to digital communication. This is required with adolescent samples, as it cannot be assumed that research with undergraduates can be extended to younger ages. Research with adolescents in this area is important, as they have grown up with mobile phones from young ages (Nielsen, 2017), and also commonly use textese (e.g., Crowe, 2014; De Jonge & Kemp, 2012), and thus this may influence their views on the appropriateness of textisms, and how they perceive others who include textisms in their writing.

Crowe (2014) investigated the responses to textism use of children and adolescents in grades 6-8 and 11-12, specifically examining their willingness to grant requests. The participants responded to fictitious messages, which differed in their modality (text, email), recipient status (peers e.g., friends, non-peers e.g., teachers), and the level of textese density (no, medium, high). Medium and high textese densities involved 15% and 35% of the message words being textisms, respectively. Participants were more likely to grant the requests of non-peers when the message writer used no or medium textese levels, as opposed to high textese levels, although not all comparisons reached significance (Crowe, 2014). This supports previous findings that high textism use is inappropriate when communicating with lecturers compared to friends (Grace et al., 2015). Unexpectedly, participants in Crowe's (2014) study were not more likely to grant requests of peers when the message writer used medium or high textese levels, as opposed to no textese. Crowe (2014) considered that as the messages were presented in a school-context, participants may have formed negative attitudes towards the use of textese by peers, and therefore were not more likely to grant their requests. Overall, the findings suggested that children and adolescents have the ability to adjust their responses to digital

messages, such as granting or denying a request, in consideration of the level of textese, message modality and recipient status.

Crowe's (2014) research appears to constitute the only experimental research that has examined children's and adolescents' responses to others' textism use. However, there is currently no research investigating whether the use of textese can also influence the perceptions adolescents form about message writers, which to date has only been examined with young adults (e.g., Lewandowski & Harrington, 2006). It is important to conduct such research with young adolescents (e.g. grade 8), as they likely have experience with writing in informal settings, such as text messaging their friends. However, as they have only recently entered secondary education, their experience in writing more formally, such as communicating digitally with teachers, is likely to be limited. Therefore, it is important that research extends the little research examining adolescents' responses to digital messages, by investigating whether changes in textese density, message modality and recipient status can also affect how they perceive the people that write these messages.

Digital communication, such as text and email messages, can have implications for the judgments formed about the message sender, due to the lack of contextual and subtle nonverbal cues normally used to form impressions in face-to-face interactions (Gill, Oberlander, & Austin, 2006; Kaye et al., 2017). Message recipients tend to increase their reliance on other cues, such as word choice and spelling errors, in order to form impressions of the message sender (Hancock & Dunham, 2001). For example, typing errors in messages may lead a message sender to be perceived as careless (Lea & Spears, 1992), and those who send grammatically correct emails can be perceived as more friendly and likeable, than those who send emails with grammatical errors (Jessmer & Anderson, 2001). More recently,

Vignovic and Thompson (2010) found young adults formed more negative perceptions (e.g., gave lower ratings on agreeableness and trustworthiness) about people who sent emails with spelling and grammatical errors. It was highlighted that such language violations tend to be more accepted in text messages, as the language violations are attributed to the small keyboards on mobile phones, and the instant and informal nature of text messaging (Vignovic & Thompson, 2010). Furthermore, when reading online personal statements that differed in their level of textese, young adults perceived those who used high levels of textese to be less conscientious and open, and to have lower self-esteem, than those who wrote in Standard English (Fullwood, Quinn, Chen-Wilson, Chadwick, & Reynolds, 2015). Taken together, the research discussed suggests that small manipulations in writing style in a digital communication context can influence the impressions formed about message writers.

Using textese inappropriately in digital communication can lead to negative consequences for message writers, which has important implications within academic settings. For example, Lewandowski and Harrington (2006) investigated whether evaluations of undergraduate students' personality and essay writing skills would be influenced by abbreviations used in their email, which had their essay attached to it. The results demonstrated that students who emailed using abbreviations, as opposed to correct grammar, were perceived as less intelligent, dependable, hard-working, motivated, responsible, and also as putting less effort into their essay. These findings highlight how abbreviations in an email can influence the impressions undergraduates form about message writers. However, there is no research comparing the impressions adolescents form about message writers who send textese in texts and in emails, and to different people. This is important to investigate, as textese is viewed as more appropriate for text messages, and for

friends (Grace et al., 2015; Turner et al., 2014), although no research has investigated whether adolescents also form more favourable impressions of others who use textese in texts compared to emails, and to friends compared to more socially distant recipients.

The Current Study

In summary, despite the introduction of Qwerty touch-screen phones and predictive texting, textese has remained popular, although the types of textisms used have changed over time (Kemp & Grace, 2017). Research suggests that textese is less appropriate in emails than texts, and less appropriate for lecturers and teachers compared to friends (Drouin & Davis, 2009; Grace et al., 2015; Kemp & Clayton, 2016), and that writing style in digital communication can affect the perceptions people form about others, especially in emails (e.g., Jessmer & Anderson, 2001; Lewandowski & Harrington, 2006; Vignovic & Thompson, 2010). However, further research is required to combine these findings and examine the perceptions adolescents form about message writers who use textese, in text and email messages, and to friends and teachers. Given the popularity of text messaging (Lenhart et al., 2015b), and the use of textese among adolescents (e.g., Crowe, 2014; De Jonge & Kemp, 2012), it is important to investigate their views, as this might have implications for how they communicate with and respond to others.

The first aim of the current study was to gain an understanding of high school-aged adolescents' use of digital communication. This was achieved by asking participants questions about their use of text messaging and emails, as well as several demographic questions.

The second and main aim was to extend previous research by examining adolescents' responses to the use of textese by others in a school setting.

Specifically, it was investigated whether participants would form different perceptions about fictitious students, when reading fictitious messages sent in different modalities (text versus email), written to different recipients (friends versus teachers), and across different levels of textese density (no, medium, or high). The perceptions of participants were measured by examining the extent to which participants agreed (on a 7-point Likert scale) that the message writers had an appropriate writing style, were intelligent, friendly, and paid attention to detail. This extends previous research that has only examined the appropriateness of textism use (e.g., Grace et al., 2015; Kemp & Clayton, 2016), as the current study investigated whether manipulating the level of textese in messages could influence how participants thought about message writers in ways beyond just their appropriateness of writing style.

The hypotheses were expressed in terms of 'more favourable ratings,' which refer to participants rating fictitious message writers as showing a more appropriate writing style, as well as greater intelligence, friendliness and attention to detail. Based on research that has found higher textese levels to be viewed as more appropriate, and to be used more, when communicating with friends compared to lecturers (e.g., Grace et al., 2015; Kemp & Clayton, 2016), it was firstly hypothesised that there would be an interaction effect between textese density and recipient status. Specifically, participants would rate message writers more favourably when they sent high and medium textese density messages to friends compared to teachers, and would rate message writers more favourably when they used no textese in messages to teachers compared to friends. It was also hypothesised that there would be an interaction effect between textese density and modality, following from research that has found higher textese levels to be more appropriate

in text messages compared to emails, given the more formal nature of emails (e.g., Drouin & Davis, 2009; Kemp & Clayton, 2016). Specifically, it was predicted that participants would rate message writers more favourably when they used high and medium textese densities in text messages than emails, but would rate message writers more favourably when they used no textese in emails than text messages.

Method

Participants

A total of 92 participants (51 females, 40 males, 1 gender not specified) took part. Students from grade 8, ranging in age from 13 to 14 years (M = 13.6, SD = .50) were recruited from two Hobart schools. A majority of participants reported sending and receiving all of their text and email messages in English, while 21 participants reported sending and receiving text messages in English 95.7% of the time, on average, and email messages in English, on average, 94.2% of the time.

Design

The study used a 3 (Textese Density: No, Medium, High) x 2 (Modality: Text message, Email) x 2 (Recipient: Friend, Teacher) repeated measures design. The dependent variables were the participants' perceptions of message writers, which were perceived appropriateness of writing style, as well as the message writers' perceived intelligence, friendliness, and attention to detail.

Data analytic approach and *a priori* power analysis. Analysis of the data was conducted using a repeated measures factorial ANOVA for each of the four dependent variables, using the 3 x 2 x 2 design stated above. The repeated measures design allowed the error variance to be significantly reduced, compared to a between-subjects design, which therefore resulted in greater sensitivity to the experimental manipulations (Keppel & Wickens, 2004). G-power calculations

determined that a minimum of 43 participants were required to detect a medium effect (Faul, Erdfelder, Lang, & Buchner, 2009).

Procedure and Materials

This study was an extension of previously approved research (H0013925), thus an ethics amendment to examine the influence of textese on adolescents' perceptions of message writers was sought and received (Appendix A). This study was also approved by the Tasmanian Catholic Education Office (Appendix B). Prior to conducting this study, informed consent was obtained from the participants, their parents or legal guardians, as well as the school principals (Appendix C). Participation was entirely voluntary, and participants were able to withdraw at any time.

Participants completed an experiment that was developed by the researcher, using the online survey tool LimeSurvey. The experiment consisted of two sections: a digital communication questionnaire, followed by a message response task, which are both outlined below. Participants completed these tasks individually, on either laptops or iPads, and under the guidance of the researcher in whole class groups. All responses were made anonymously, and participants took approximately 20 minutes to complete the whole experiment.

Digital communication questionnaire. Participants responded to questions concerning their age, gender, mobile phones, and their use of text and email messaging (adapted from Crowe [2014], see Appendix D).

Message response task. To examine the perceptions participants form about message writers, 12 fictitious messages, which were developed by the researcher, were presented to participants. Each of the messages varied in their *modality* (text, email), *recipient* (friend, teacher), and *textese density* (no, medium, high). Therefore,

each message in the task represented one possible combination (out of 12) of these message variables. For example, one combination was a text message, written to a friend with a medium level of textese. The message sender was always described as a student, and participants were asked to imagine that this fictitious student was in grade 8, the same as the participants.

Participants were required to read each message, and to then rate the message writer on several characteristics. Specifically, they were asked to rate how much they agreed that the message writer had an appropriate writing style, was intelligent, friendly, and paid attention to detail. These ratings were made on a 7-point Likert scale, from strongly disagree to strongly agree. A 7-point scale was used to allow participants to differentiate their perceptions of the message writers more finely than if only 5-points were offered, while still ensuring that each point retained meaning (Krosnick & Presser, 2010). Given that the participants were in grade 8, the anchor options were centred on "agreeing" for simplicity, and each anchor was presented with a verbal label (e.g., anchor 5: *slightly agree*), in order to clarify each anchor's meaning to participants, and to minimise interpretation issues. Furthermore, the scale included a neutral anchor (anchor 4: *neither agree or disagree*) so that participants were not forced to agree or disagree with the statements about the message writers, thus providing a more accurate measurement of the participants' perceptions (Krosnick & Presser, 2010). Lastly, the scale stems (e.g., *Matt is friendly*), had a Flesch-Kincaid readability score of between 1.9 and 7.3 (Kincaid, Fishburne, Rogers, & Chissom, 1975), confirming that they were understandable for the reading level of grade 8 participants.

Message generation. The experimental messages contained school-related content, and were initially written in Standard English. Each message was

approximately 40 words in length (M = 41.1, SD = 3.4).

Pilot study. A pilot study was conducted to ensure that in the main experiment, participants' responses could be attributed to the manipulation of textese density, modality and recipient, and not due to the content of the messages. A total of 30 participants (22 females, 8 males), with ages ranging from 19 to 49 years (M = 24.4, SD = 6.9), participated in the pilot study, and were not further involved with the main experiment. These participants were currently completing or had completed, an undergraduate degree (n = 23) or a postgraduate degree (n = 7). Participants were invited to take part in the pilot study via social media and through the university's online teaching platform. The participants completed the study individually, during their own time, and took approximately 10 minutes to complete it.

The pilot participants viewed the 12 experimental messages written in Standard English, and these were presented as a typed-out message in a text box on LimeSurvey (see Figure 1). Furthermore, the message modality (text or email) and recipient (friend or teacher) were not specified. This was done to determine whether the participants would view all of the message writers similarly in terms of their appropriateness of writing style, intelligence, friendliness, attention to detail, based only on the message content. Participants rated the message writers on these characteristics using Likert scales as described in the main experiment. The 12 messages and the four statements presented with each message were presented in a randomised order, to control for any potential order effects (Christensen, 2004). The results of this pilot study were then used to make alterations to the experimental messages, in order to make each message writer appear as similar as possible.

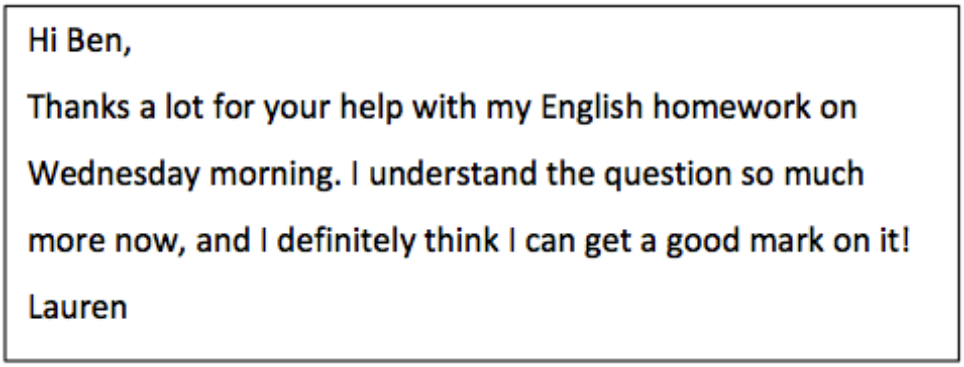

Figure 1. Example pilot message written in Standard English

The mean ratings of messages were analysed for each of the four dependent variables, to examine whether participants rated the message writers similarly. It was determined that if any messages had a mean rating that was more than 1 point further away on the Likert scale from the other messages (higher or lower), then this would indicate that there was something about the message content or wording that had influenced how participants had rated the message writer.

The mean ratings for most of the messages for each of the dependent variables were made within a narrow band, of an average of 1 Likert scale point. No alterations were made to the messages in regards to intelligence and appropriateness of writing style, as the ratings for these dependent variables were very similar. The mean ratings of perceived friendliness for two of the messages were relatively low compared to the other messages, and therefore these two messages were reworded to make the writers sound slightly friendlier. For example, the following message required some alterations: *Hi Sarah, I'm coming to the afternoon tea at school tomorrow, but I just wanted to tell you that I'm allergic to nuts. Mrs Brown said that I should let you know. See you tomorrow afternoon, Hannah.* In order to overcome the tendency for participants to perceive Hannah as less friendly than other message

writers, '*I'm coming…'* was substituted with '*I'm looking forward to…*' Lastly, the mean rating for perceived attention to detail for one of the messages was relatively high. Accordingly, the wording of this message was adjusted to make the writer of this message sound less attentive to detail. This involved changing the phrase, '*I have got a dentist appointment*' to '*I forgot I had a dentist appointment.*'

Post-pilot study message generation. After adjusting the messages following the pilot study, each message was then edited to create three textese density versions (no, medium, high, see Table 1). These textese density versions were based on the textese densities reported by Grace et al. (2012), where 'no textese messages' contained zero textisms, 'medium textese messages' had a mean textese density of 15% (*SD* = .81%), and 'high textese messages' had a mean textese density of 35% (*SD* = 1.25%). The textese densities were calculated by dividing the number of textisms in the message by the overall number of words in the message. The medium and high textese messages contained textisms that were commonly found in the text messages of adolescents and young adults in recent naturalistic research (Crowe, 2014; Kemp & Grace, 2017). These included missing capital letters and apostrophes (e.g. *i didnt* for *I didn't*), shortenings (*Fri* for *Friday*), homophones (e.g. *u* for *you*) and additional letters (*soooo* for *so*).

Table 1

Example of the Three Textese Density Message Versions

Textese level	No. of words	No. of textisms	Textese density (%)	Message
No	38	0	0	Hi Luke, I'm not going to be able to make it to cricket training on Wednesday afternoon. I've got a doctor's appointment, and I wasn't able to change the time. I'll definitely be there next week though! Josh
Medium	38	6	16	Hi Luke/ Mr Lucas, Im not going to be able to make it to cricket training on wednesday afternoon. Ive got a doctor's appt, and i wasn't able to change the time. i'll definitely be there next week though! Josh
High	38	13	34	Hi luke, Im not gonna be able to make it to cricket training on wednesday arvo. ive got a doctor's appt, and i wasnt able to change the time. i'll defs be there next week though!!! Josh

To manipulate the recipient status of the messages, each message was either addressed to a friend (e.g., *Luke*) or a teacher (e.g., *Mr Lucas*). To clearly communicate the modality of each message, the text messages were presented as screenshots of an iPhone message (see Figure 2) and the email messages were presented as screenshots of an email message window (see Figure 3). Each message was presented with a written explanation of the message modality (text or email message) and recipient (friend or teacher) to minimise confusion.

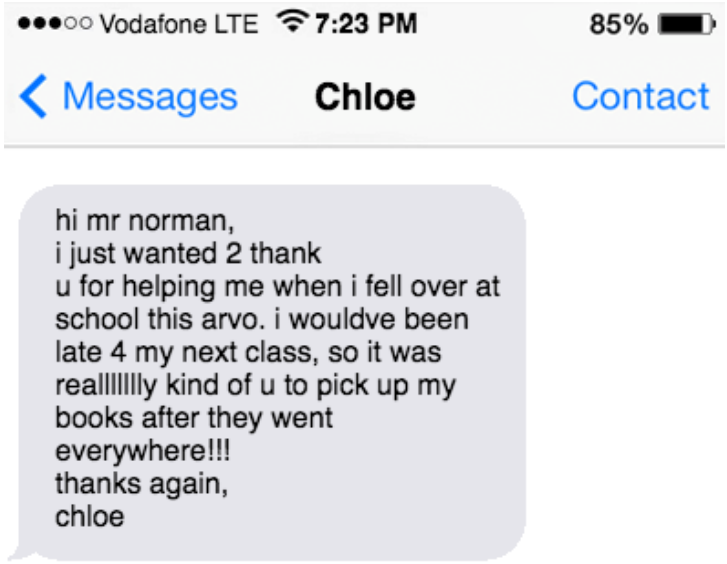

Figure 2. Example text message written to a teacher in high textese.

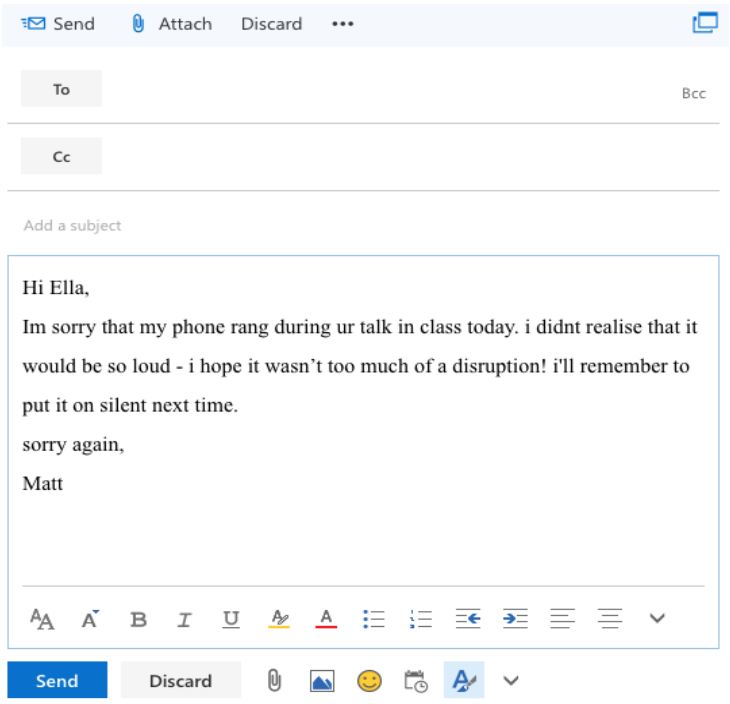

Figure 3. Example email message written to a friend in medium textese.

A fully counterbalanced design would have resulted in 144 message versions, as each of the 12 messages could be presented in 12 different ways. To make data collection feasible in the context of the current study, a subset of the message versions were randomly selected to be included in the experiment (Appendix E). This meant that all participants viewed the same 12 messages (in terms of content), however, different participants viewed different versions of the same message (in terms of modality, recipient, and textese density). The purpose of this was to prevent any biases in responding that may have occurred if particular messages were always presented in the same way. To control for response biases due to the language style of messages and for fatigue effects, the message presentation order was randomised for every participant (Christensen, 2004).

The experiment concluded with two further questions that served as a manipulation check. Participants were asked to rate, on a 7-point Likert scale (1=

Strongly disagree, 7= *Strongly agree*), how much they agreed with the two statements, '*I noticed the writing/spelling style of the messages in this survey'* and '*The writing/spelling style of the messages affected my answers.'* These questions were included to determine if the participants paid attention to the stimuli, which would demonstrate that the manipulation of textese had been perceived as intended.

Results

Preliminary Data Screening

The data collected from the digital communication questionnaire and message response task were thoroughly checked before analyses were conducted. Three participants were excluded from the analyses, as they did not complete the whole task. One participant provided implausible estimates of their digital communication use (e.g., reported sending text messages for 5000 years). Inspection of box-plots confirmed that this participant was an outlier on multiple measures, and therefore they were removed from all analyses.

The manipulation check found that participants agreed that they noticed the messages' writing style (M = 6.22, SD = .88), and agreed that the writing style affected their answers (M = 5.79, SD = 1.15). This indicated that the manipulation of textese density was obvious.

The assumption of normality was tested via examination of histograms, as well as skewness and kurtosis statistics, with these suggesting that the message response data was reasonably normally distributed. Importantly, analyses based on the F-distribution are relatively robust to breaches of normality (Keppel & Wickens, 2004). Mauchly's test indicated that the assumption of sphericity had been violated for the main effects of textese density across all four dependent variables, as well as for the interaction between textese density and modality for the dependent variables

of friendliness and attention to detail. A Huynh-Feldt correction was applied to all of these, as the Greenhouse-Geisser estimate was greater than .75 (Huynh & Feldt, 1976).

Digital Communication Questionnaire

Participants provided demographic information regarding their digital communication use, including their text messaging and email usage and experience, and characteristics of their mobile phones. The majority of participants reported owning a mobile phone with a touch-screen Qwerty keypad (96.7%), while a very small minority of participants used an external Qwerty keypad (2.1%) or the older style alphanumeric keypad (1.1%). More than half (55.4%) of participants used predictive text-entry systems, while 26.1% reported always using this system, and 18.5% reported never using predictive texting on their mobile phone. When sending and receiving emails, 41.3% of participants reported mostly accessing these on the computer, while 35.9% mostly used their mobile phone, and 22.8% of participants accessed their emails via computer and mobile about equally. However, many participants also reported using an iPad to access their emails.

Overall, participants reported that they had been text messaging for between less than a year and nine years (M = 3.04, SD = 1.58) and had been using email for between less than a year and eight years (M = 3.73, SD = 1.68). Figure 4 shows the participants' estimations of the number of text and email messages they sent and received each day. Participants' estimations varied widely, although it was evident that they sent and received more texts than emails.

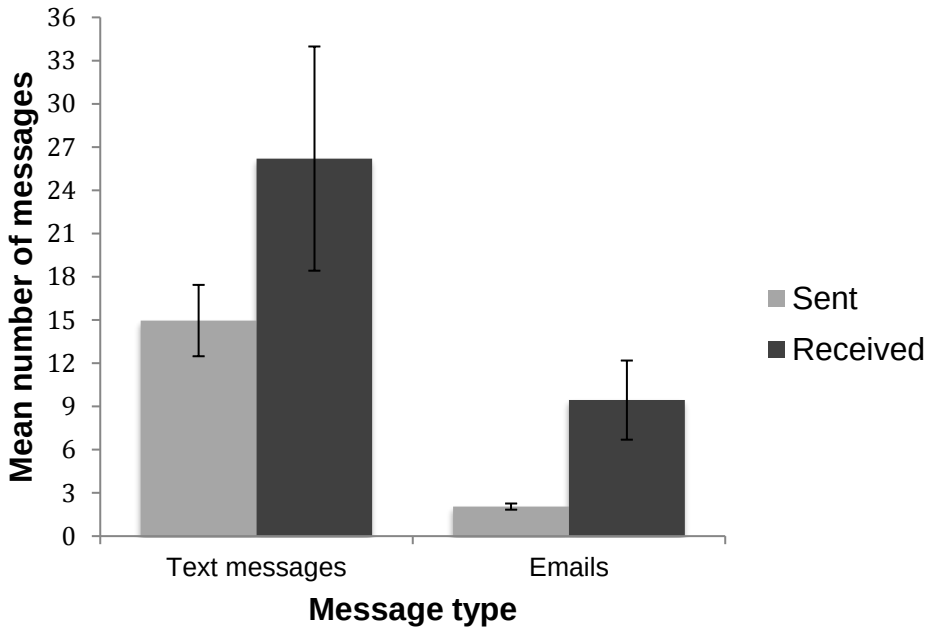

Figure 4. Means and standard errors for the estimated number of messages sent and received each day.

Message Response Task

The data consisted of participants' ratings of the message writers, where a high rating (i.e., 7) indicated that participants strongly agreed that the message writer had an appropriate writing style, was intelligent, was friendly, or paid attention to detail. A 3 x 2 x 2 repeated measures ANOVA was conducted for each of these four dependent variables, to investigate participants' differences in perceptions of the message writers, with textese density (no, medium, high), modality (text, email) and message recipient (friend, teacher) as the repeated measures factors. An alpha level of .05 was used for all statistical tests. However, Bonferroni adjustments were applied to all post-hoc pairwise comparisons that were conducted, to control for Type 1 errors (i.e., for 3 pairwise comparisons, $\alpha = .017$).

Perceptions of the message writers' appropriateness of writing style. Please refer to Table 2 for all of the mean ratings for the main effects. A significant

and large main effect of textese density was found, $F(1.7, 153.4) = 289.51$, $p < .001$, $\eta^2 = .761$. Post-hoc pairwise comparisons revealed that message writers were perceived as writing less appropriately as textese density increased, where perceived appropriateness of writing style significantly decreased from no textese, to medium textese, to high textese, all *p*s < .05. There was a significant moderate main effect of recipient status, $F(1, 91) = 72.69$, $p < .001$, $\eta^2 = .444$, where participants perceived message writers to write significantly less appropriately when they wrote to their teachers compared to their friends. There was no significant main effect of modality, $F(1, 91) = .36$, $p = .549$, $\eta^2 = .004$.

Table 2

Mean Ratings for the Main Effects of Textese Density, Recipient Status, and Modality

	Textese density			Recipient status		Modality	
	No	Medium	High	Friend	Teacher	Text	Email
Dependent variable	*M* (*SE*)	*M* (*SE*)	*M* (*SE*)	*M* (*SE*)	*M* (*SE*)	*M* (*SE*)	*M* (*SE*)
Appropriateness of writing style	6.07 (.08)	4.39 (.12)	3.37 (.10)	4.98 (.09)	4.23 (.08)	4.63 (.08)	4.59 (.08)
Intelligence	5.60 (.09)	4.62 (.10)	3.85 (.09)	4.83 (.08)	4.55 (.07)	4.68 (.08)	4.70 (.08)
Friendliness	6.02 (.08)	5.75 (.08)	5.51 (.09)	5.87 (.08)	5.64 (.07)	5.74 (.08)	5.77 (.07)
Attention to detail	5.83 (.09)	4.12 (.12)	3.24 (.11)	4.55 (.09)	4.25 (.08)	4.43 (.08)	4.37 (.09)

However, the main effects of textese density and recipient status were subsumed by three significant, two-way interactions, which were all interpreted using post-hoc pairwise comparisons (see Figure 5 for all interactions). Firstly, there was a significant small interaction between textese density and modality, $F(2, 182) = 4.14$, $p = .017$, $\eta^2 = .044$. When messages included no textese, the message writers were perceived as writing significantly more appropriately in emails compared to text messages. There was also a significant large interaction between textese density and recipient status, $F(2, 182) = 37.00$, $p < .001$, $\eta^2 = .289$. Specifically, in medium textese messages, the message sender's writing style was perceived as significantly less appropriate when the message was written to a teacher, as opposed to a friend, $p < .001$. This pattern of results was also evident in high textese messages ($p < .001$), where participants viewed message writers as writing significantly less appropriately to teachers than to friends. Lastly, there was a significant moderate interaction between modality and recipient status, $F(1, 91) = 19.53$, $p < .001$, $\eta^2 = .177$. Message writers were perceived as writing significantly more appropriately when texting friends compared to teachers, and when emailing friends compared to teachers, both ps $< .001$. There were no other significant differences or interactions present.

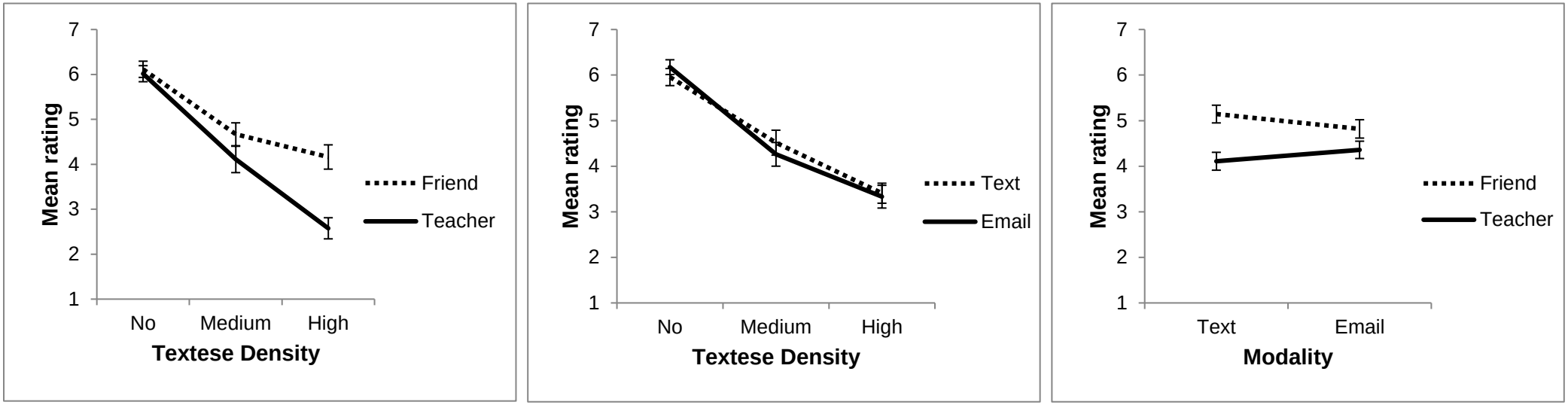

Figure 5. Means and 95% CIs for perceptions of appropriateness of writing style, for the interaction between textese density and recipient (left), the interaction between textese density and modality (centre), and the interaction between modality and recipient (right), all significant.

Perceptions of the message writers' intelligence. Table 2 presents all of the mean ratings for the main effects. The ANOVA revealed a significant main effect of textese density, $F(1.7, 153.3)= 148.87$, $p < .001$, $\eta^2 = .621$, this was a large effect. Analysis of post-hoc pairwise comparisons demonstrated that message writers were perceived to be less intelligent when they used more textese, where perceived intelligence significantly decreased from no textese, to medium textese, to high textese, all *p*s < .05. There was a significant moderate main effect of recipient status, $F(1, 91)= 21.39$, $p < .001$, $\eta^2 = .190$, where participants perceived the message writers to be significantly less intelligent when they wrote to their teachers compared to their friends. There was no significant main effect of modality, $F(1, 91)= .064$, $p = .801$, $\eta^2 = .001$.

The main effects of textese density and recipient status must be interpreted cautiously as there were also two significant two-way interactions, which were then followed-up using post-hoc pairwise comparisons (interactions are presented in Figure 6). There was a significant interaction between textese density and modality, $F(2, 182)= 4.15$, $p = .017$, $\eta^2 = .044$, with a small effect size evident. However, following Bonferroni adjustments to the alpha level, it was found that participants did not perceive the message writers to differ significantly in their intelligence, when they wrote texts or emails with a medium level of textese ($p = .050$, $d = .155$). Lastly, a moderately sized significant interaction between textese density and recipient status, $F(2, 182)= 10.81$, $p < .001$, $\eta^2 = .106$, revealed that when high levels of textese were used, participants perceived the writers to be significantly less intelligent when they wrote to a teacher compared to a friend, $p < .001$. No further significant differences or interactions were found.

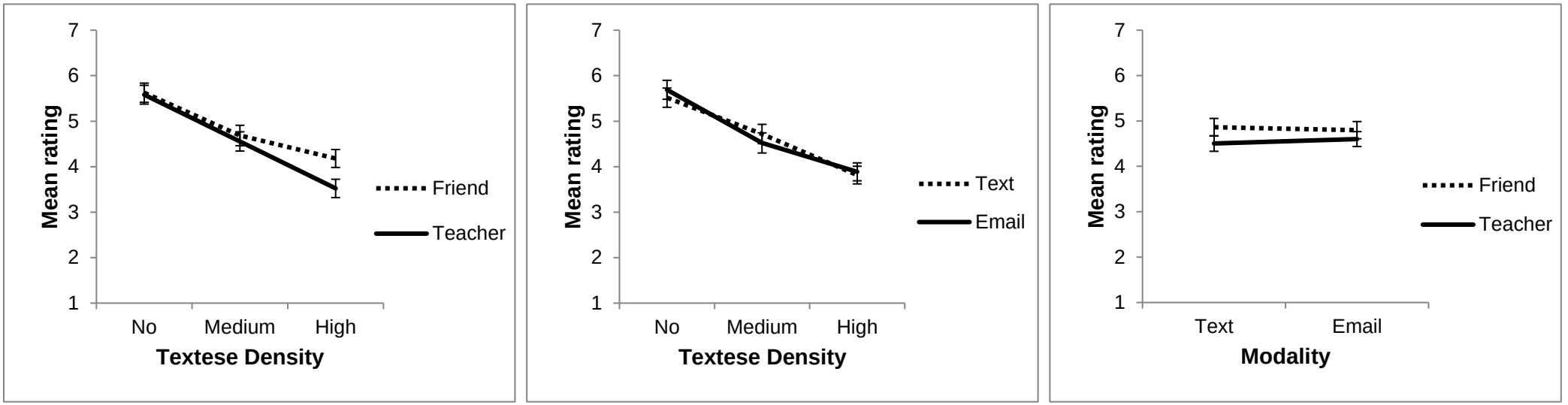

Figure 6. Means and 95% CIs for perceptions of intelligence, for the significant interaction between textese density and recipient (left), the significant interaction between textese density and modality (centre), and the non-significant interaction between modality and recipient (right).

Perceptions of the message writers' friendliness. See Table 2 for all of the mean ratings for the main effects. A significant moderate main effect of textese density was found, $F(1.8, 168.2)= 22.34$, $p < .001$, $\eta^2 = .197$. When followed-up with pairwise comparisons, it was found that message writers were perceived as being less friendly when they used more textese in their messages, where participants' perceptions of friendliness significantly decreased from no textese, to medium textese, to high textese, all *p*s < .05. There was a significant medium main effect of recipient status, $F(1, 91)= 18.57$, $p < .001$, $\eta^2 = .170$, where participants perceived the message writers to be significantly less friendly when they wrote to their teachers compared to their friends. There was no significant main effect of modality, $F(1, 91)=.30$, $p = .588$, $\eta^2 =.003$.

The main effects of textese density and recipient status were subsumed by a significant interaction between textese density and recipient status, $F(2, 182)= 6.92$, $p = .001$, $\eta^2 = .071$ (refer to Figure 7 for all interactions). This had a small effect size, and was then analysed using pairwise comparisons. These showed that participants perceived the message writers to be significantly less friendly when they wrote messages with a high level of textese to teachers, compared to friends, $p < .001$. Following Bonferroni adjustments, participants did not perceive writers differently in regards to their friendliness, when they wrote with a medium level of textese to teachers and friends ($p = .048$, $d = .176$). There were no further significant differences or interactions.

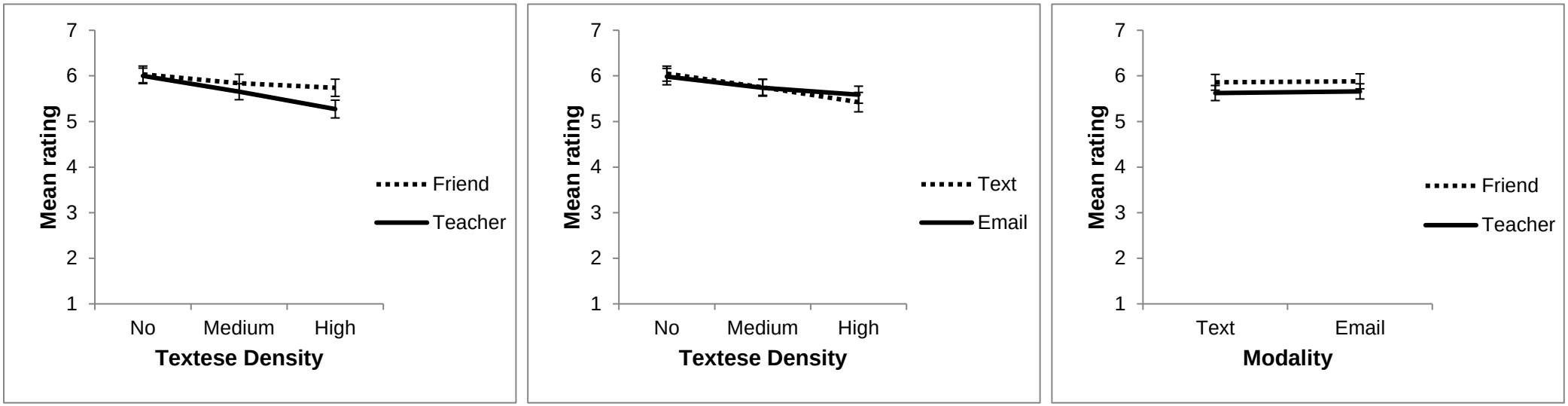

Figure 7. Means and 95% CIs for perceptions of friendliness, for the significant interaction between textese density and recipient (left), the interaction between textese density and modality (centre), and the interaction between modality and recipient (right), both non-significant.

Perceptions of the message writers' attention to detail. Please refer to Table 2 for all of the mean ratings for the main effects. There was a significant and large main effect of textese density, $F(1.6, 143.9)= 219.04$, $p < .001$, $\eta^2 = .706$. Post-hoc pairwise comparisons demonstrated that message writers were perceived as being less attentive to detail, the more textese they used in their messages, where perceived attention to detail significantly decreased from no textese, to medium textese, to high textese, all *p*s < .05. There was a significant medium main effect of recipient status, $F(1, 91)= 22.59$, $p < .001$, $\eta^2 = .199$, where participants perceived message writers to pay significantly less attention to detail when they wrote to their teachers compared to their friends. There was no significant main effect of modality, $F(1, 91)= .76$, $p = .385$, $\eta^2 =.008$.

Interpretation of the main effects of textese density and recipient status was done cautiously, as there were two significant, two-way interactions, which were all followed-up with pairwise comparisons (interactions are presented in Figure 8). Firstly, a significant medium interaction between textese density and recipient status was found, $F(2, 182)= 12.41$, $p < .001$, $\eta^2 = .120$. When message writers used a high level of textese, they were perceived as paying significantly less attention to detail when the message was written to a teacher rather than a friend, $p < .001$. There was also a significant medium interaction between modality and recipient status, $F(1, 91)= 16.27$, $p < .001$, $\eta^2 = .152$. This demonstrated that participants perceived message writers to pay significantly less attention to detail when they texted their teachers, compared to when they texted their friends, $p < .001$. No further significant differences or interactions were present.

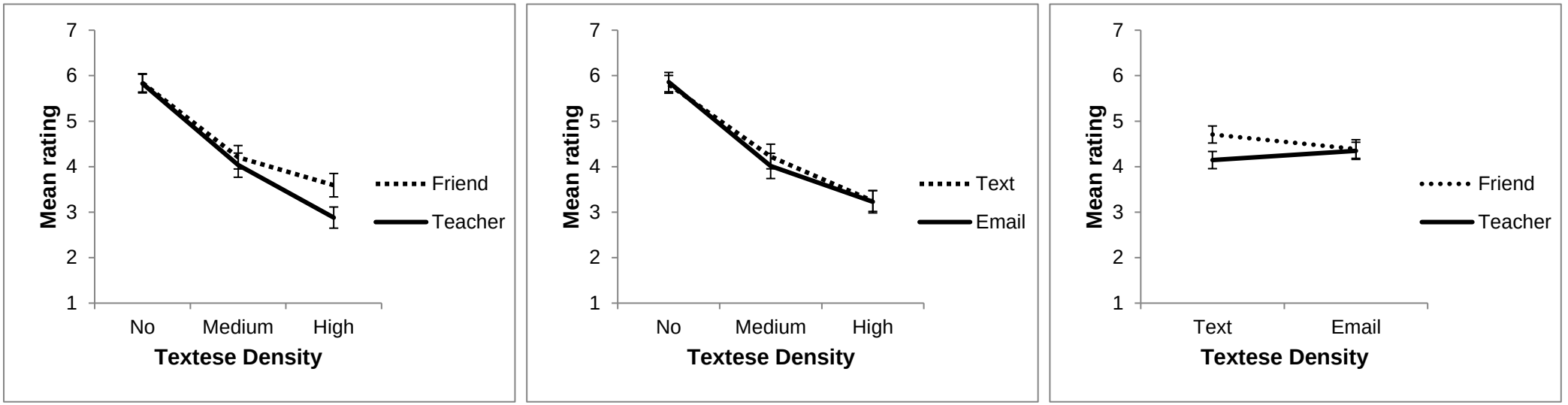

Figure 8. Means and 95% CIs for perceptions of attention to detail, for the significant interaction between textese density and recipient (left), the non-significant interaction between textese density and modality (centre), and the significant interaction between modality and recipient (right).

Discussion

The purpose of this study was to examine how changes in textese density, modality, and the recipient type of messages could influence the perceptions that adolescents form about message writers. Adolescents' self-reported use of digital communication was also examined, specifically in relation to their use of text messaging and emails. Consistent with recent Australian statistics (Roy Morgan Research, 2016), all participants reported owning a phone, with the overwhelming majority owning a mobile phone with a touch screen Qwerty keypad. Just over half of the participants used predictive text-entry systems occasionally, and about a quarter always used predictive text, with the rest reporting never using this function. Similar proportions of participants accessed their emails only by computer, and only by their mobile phone, suggesting that advances in mobile phone technology have made emails more accessible. Furthermore, many participants informally reported using iPads to access their emails. Together these findings highlight that digital communication is central to adolescents' lives, and adolescents are especially likely to keep up with the advances in digital technology, as almost all participants owned a touch-screen phone, many also owned iPads, and a large proportion used predictive text.

Participants had been texting and emailing for about three years on average, however, some participants reported text and email experience of nine years. While such estimates may be unreliable (considering participants were 13 and 14 years old), this aligns with recent statistics suggesting that children are being exposed to mobile phone technology at increasingly younger ages (Nielsen, 2017). On average, participants reported sending about 15 text messages each day, and receiving approximately 26 texts. However, some participants provided unrealistic estimates of

their text messaging habits, and thus this data should be interpreted cautiously. Participants sent about 2 emails per day, and received about 9 emails per day, suggesting that high school-aged adolescents do not use email as frequently as other, more informal modes of digital communication.

The main aim of the study was to investigate the perceptions adolescents formed about others who used varying levels of textese in text or email messages, which were written to friends or teachers. This was measured by examining the extent to which participants agreed (on a 7-point Likert scale) that the message writers had an appropriate writing style, were intelligent, friendly, and paid attention to detail.

It was hypothesised that participants would rate message writers more favourably when they sent high and medium textese density messages to friends compared to teachers, and would rate message writers more favourably when they used no textese in messages to teachers compared to friends. The results partially supported this hypothesis across all dependent variables, as message writers who used medium and high textese when writing to friends were rated more favourably than when writing to teachers. However message writers were rated similarly when they used no textese to friends and teachers. This suggested that while textese is acceptable when communicating with friends (Turner et al., 2014), adolescents also view messages written to friends in Standard English as acceptable.

Participants rated the message writers as having a less appropriate writing style when they used medium and high levels of textese, when writing to teachers compared to friends. Specifically, participants disagreed that the message writers had an appropriate writing style, when using high textese to teachers, and were relatively neutral in their perceptions of appropriateness when medium textese were used. This

is consistent with previous research conducted with undergraduates, where textese use was perceived as more appropriate in messages to friends than to lecturers (Kemp & Clayton, 2016), particularly for high textese messages (Grace et al., 2015), as well as reports from adolescents suggesting that Standard English is important when communicating with teachers, but not necessarily with friends (Turner et al., 2014). The current study's findings highlight that adolescents, like young adults, do view teachers as more socially distant than friends, and thus when communicating with them, a more formal writing style is more appropriate.

The participants' perceptions of the message writers' attention to detail, intelligence, and friendliness aligned with their perceptions of appropriateness of writing style, although only for high textese messages. For high textese messages to teachers, participants slightly disagreed that the message writer paid attention to detail, and slightly disagreed that they were intelligent. These ratings were significantly lower than for high textese messages written to friends. However, it should be acknowledged that the participants did not form strong negative perceptions about message writers' attention to detail and intelligence, which was also found by Lewandowski and Harrington (2006). For perceptions of friendliness, when high levels of textese were used in messages to teachers, the participants still slightly agreed that the message writer was friendly. These findings demonstrate that textese-dense messages do not have as much of a negative influence on perceptions of a writer's friendliness, in comparison to perceptions of appropriateness of writing style, their attention to detail, and their intelligence. Previous research has suggested that message writers are viewed as less friendly when they make grammatical errors in their message (e.g., Jessmer & Anderson, 2001). However, textisms are not simply grammatical errors, as adolescents include textisms in their writing to express

themselves more clearly and to be creative (Turner et al., 2014). Therefore, the textisms used in the current study may have highlighted the creativity and expression the message writer was trying to convey, thus making them still appear friendly, even when writing to teachers.

It was also hypothesised that participants would rate message writers more favourably when they used high and medium textese densities in text messages than emails, but would rate message writers more favourably when they used no textese in emails than text messages. The findings for ratings of appropriateness of writing style support this expected relationship, although only the use of no textese in emails was perceived as significantly more appropriate than in text messages. This aligns with the existing literature that has found emails to be a more formal mode of communication than text messages, and thus a less appropriate place to write in textese (Drouin & Davis, 2009). In the current study, participants still agreed that those who used no textese in text messages had an appropriate writing style. This suggests that textisms are not always considered necessary when communicating with others via text message. However, while no textese was viewed as more appropriate for use in emails than text messages, participants did not significantly vary their perceptions of message writers' intelligence, friendliness, and attention to detail when they used Standard English in emails and text messages. A possible explanation for this finding is that appropriateness of writing style is not necessarily related to our perceptions of others being intelligent, friendly, and paying attention to detail.

Furthermore, contrary to predictions, when medium and high levels of textese were used in text messages and emails, participants did not significantly vary their perceptions of the message writers, across all dependent variables. These findings are

inconsistent with previous research that has found textese to be used more in texts than emails (Kemp & Clayton, 2016), and that textese is also viewed as more appropriate in texts than emails, as emails are a more formal mode of communication (Grace et al., 2015; Kemp & Clayton, 2016). A possible explanation for the current findings is that as the messages contained school-related information, and were presented in a school-context, participants may have viewed textese-dense messages to be less acceptable overall (Crowe, 2014). A further explanation may be that as the participants reported sending and receiving many less emails than text messages each day, grade 8 students may be less familiar with the formality of emails. For example, that they should be written more formally than a text message and adhere to Standard English grammar. Accordingly, the participants did not rate message writers less favourably when they emailed using textese.

Lastly, there was an unexpected interaction between message modality and the message recipient, for perceptions of the message writers' attention to detail and appropriateness of writing style. Participants perceived message writers to pay significantly less attention to detail when they texted their teachers compared to their friends, while they perceived the message writers to pay a similar amount of attention to detail when emailing friends and teachers. Participants also perceived message writers to have a significantly less appropriate writing style when texting and emailing their teachers as opposed to friends. It was observed that perceptions of the message writers' appropriateness of writing style decreased from texts to emails written to friends, and increased from texts to emails written to teachers. While this interaction effect was not hypothesised, the findings highlight that text messages were viewed by participants as a more informal mode of communication than emails (as found by Kemp & Clayton, 2016). Therefore, emails are a more acceptable way

to communicate with teachers. In designing the current study, it was acknowledged that students do not normally text their teachers (also noted by Grace et al., 2015), and students do not generally email other students, and thus the messages would not be entirely ecologically valid. However, as this was the first study to examine the perceptions adolescents form about message writers who use textese in texts and emails, and to friends and teachers, all combinations of message modality and recipient were included in order to make full comparisons.

Limitations and Recommendations

This study had several limitations that could be improved upon in future research. Firstly, the experimental messages were long (i.e., approximately 40 words) in comparison to naturalistic text messages collected from undergraduate students in 2015, which were an average of 14 words (Kemp & Grace, 2017). Therefore, the current study's messages lacked some ecological validity (Christensen, 2004). Longer messages were chosen for use in the current study to allow more textese to be presented (i.e., high textese messages had approximately 14 textisms), as well as ensuring that the messages could be presented as both emails and texts, thereby strengthening the experimental manipulation. Nonetheless, this approach may mean that participants varied their perceptions of the message writers because there were more textisms present in each message to influence their views, and that shorter messages may not produce a similar effect. Future research should consider presenting participants with shorter experimental text messages that align more closely with the current text message lengths seen in naturalistic research.

A second limitation relates to the types of textisms included in the experimental messages, which may limit the generalisability of the results. While the messages included textisms that were commonly used by participants in recent

naturalistic research, also conducted in the same city as this study (Crowe, 2014; Kemp & Grace, 2017), some popular textisms, such as emoticons and particular expressive textisms (e.g., *xx* representing kisses), were not included in the messages. This was because these textisms could not replace message words, but would add to the word count in medium and high textese messages. Therefore, to maximise the experimental control, the medium and high textese messages only included textisms that replaced or adjusted the words of the no textese messages (e.g., *thurs* instead of *Thursday*). Future research should investigate how the inclusion of emoticons or "kisses" in messages could affect the perceptions of message writers. For example, writing style may be viewed as even more inappropriate if a "kiss" was sent to a teacher, but sending "kisses" to friends may increase perceptions of friendliness.

A final limitation is possible demand characteristics, whereby aspects of the experiment may have cued participants to respond to the messages in a way they believed was expected (Christensen, 2004). In the manipulation check, participants agreed that they noticed the messages' writing style, and agreed that the writing style affected their answers. This indicates that the changes in textese density were obvious enough for participants to notice, as hoped. However, it may also suggest that as participants were being asked what they thought about the message writers, they rated message writers in ways that conformed to their perceptions of how they were expected to respond (e.g., rating message writers less favourably when they used high levels of textese to teachers). The current study provides good insight into the perceptions adolescents form about message writers who use textese. However, future research could be more qualitative and naturalistic, in order to reduce demand characteristics (Christensen, 2004). For example, showing participants, individually, different messages, and asking them about their first impressions of message writers.

Although beyond the scope of the current study, it is worthwhile noting that young people use a number of other mobile phone features to communicate, such as Facebook messenger, Snapchat, and Instagram (Grieve, 2017; Lenhart et al., 2015a). Therefore, future research could aim to capture a broader picture of adolescents' digital communication use, by collecting estimates of the number of messages they send through multiple communication modalities. Furthermore, when asking adolescents how they access their emails, options for devices other than mobile phones and computers should be provided, such as iPads, given the changing nature of technology.

Lastly, the participants' perceptions of friendliness were not affected as negatively by high textese use, as were perceptions of appropriateness of writing style, intelligence, and attention to detail. Therefore, it would be interesting for future research to extend the findings of the current study, by examining how textese may affect adolescents' (or adults') perceptions of other attributes of message writers. For example, people who use textese are not always perceived negatively, where the use of textese has been found to increase ratings of emotional stability (Fullwood et al., 2015), and increase perceptions of intimacy with others (Liu, Lin, & Huang, 2012).

Implications and Additional Directions for Future Research

This study examined how adolescents perceive others who use textese in their messages. This was important to examine, as earlier research has found that young adults form more negative perceptions about others who use textese (e.g., Fullwood et al., 2012; Lewandowski & Harrington, 2006). However, it was unclear if adolescents would form similar perceptions, considering that text messaging is central to adolescents' lives today (Lenhart et al., 2015b), and they have been exposed to such technology from young ages (Nielsen, 2017). The adolescents in this

study had an awareness of the acceptable use of textese for different message recipients, such as the inappropriateness of high textese use when communicating with teachers. One important implication of these findings is that the adolescents in this sample were not immune to the presence of textese, and thus realised the boundaries for its use. Additionally, their perceptions of appropriateness aligned with their perceptions of the sender's intelligence, friendliness, and attention to detail, which extends previous research that has only examined the appropriateness of textism use (e.g., Grace et al., 2015; Kemp & Clayton, 2016). These findings also have implications for adolescents' writing in real world scenarios, as well as for future research. It is possible that when adolescents communicate with others, their writing style may align with their own perceptions of others who write with textese. For example, not including textisms when communicating with a teacher, as they perceived others who used high textese to teachers less favourably.

However, the current study did not examine the association between adolescents' own use of textese, and the perceptions they formed about the message writers. Participants' frequency of text messaging was examined, while their frequency of textese use was not. Therefore, future research should examine whether adolescents write to others in a way that is consistent with their perceptions. This is important, because if those who frequently use textese perceive others more favourably, even in more formal contexts, then these adolescents may require some education regarding the boundaries for textese use in digital communication.

Finally, the results of this study suggest that small manipulations in digital writing style can lead adolescents to form more negative perceptions of others (in line with Fullwood et al., 2015; Lewandowski & Harrington, 2006). This highlights that the lack of contextual and nonverbal cues in digital communication can lead

adolescent message readers to rely on other cues, such as writing style, when making judgments about a message writer (Hancock & Dunham, 2001). The main implication of this is that adolescents should be mindful of this when communicating digitally.

Conclusion

The present study was the first to examine how adolescents perceive others who use textese in their messages. It was found that adolescents perceived other (fictitious) adolescents to have a less appropriate writing style, as well as being less intelligent, friendly and as paying less attention to detail, when they used high levels of textese to teachers compared to friends. However, the adolescents did not significantly differ in their perceptions of others when medium and high textese were used in text and email messages. Together, these results suggest that adolescents are sensitive to the recipients of messages when considering writing style, but are less sensitive to the differences in formality of text and email messages. Overall, the use of textese can negatively influence adolescents' perceptions of others, particularly when there are high levels of textese in messages to teachers compared to friends.

References

Australian Bureau of Statistics (2017). *Internet Activity, Australia, June 2017* (Cat. No. 8153.0). Retrieved from http://www.abs.gov.au/AUSSTATS/abs@.nsf/Lookup/8153.0Main+Features1June%202017?OpenDocument

Australian Communications and Media Authority (2016). *Communications Report 2015-2016.* Australian Government. Retrieved from https://www.acma.gov.au/-/media/Research-and-Analysis/Report/pdf/ACMA-Communications-report-2015-16-pdf.pdf?la=en

Christensen, L. B. (2004). *Experimental methodology.* Boston, Massachusetts: Allyn & Bacon.

Crowe, S. (2014). *Txtese @ Skool: How students and teachers use and respond to the language of digital communication* (Unpublished Honours thesis). University of Tasmania, Australia.

Crystal, D. (2008). *Txting: The gr8 db8.* Oxford: Oxford University Press.

De Jonge, S., & Kemp, N. (2012). Text-message abbreviations and language skills in high school and university students. *Journal of Research in Reading, 35*(1), 49-68. doi:10.1111/j.1467-9817.2010.01466.x

Deloitte (2015). *Mobile consumer survey 2015- The Australian cut*. Retrieved from http://landing.deloitte.com.au/rs/761-IBL-328/images/deloitte-au-tmt-mobile-consumer-survey-2015-291015.pdf

Drouin, M., & Davis, C. (2009). R u txting? Is the use of text speak hurting your literacy? *Journal of Literacy Research, 41*(1), 46-67. doi:10.1080/10862960802695131

Drouin, M., & Driver, B. (2014). Texting, textese and literacy abilities: a naturalistic study. *Journal of Research in Reading, 37*(3), 250-267. doi:10.1111/j.1467-

9817.2012.01532.x

Faul, F., Erdfelder, E., Lang, A., & Buchner, A. (2007). G*power 3: A flexible statistical power analysis program for the social, behavioral, and biomedical sciences. *Behavior Research Methods, 39*(2), 175-191. Retrieved from http://www.gpower.hhu.de/fileadmin/redaktion/Fakultaeten/Mathematisch-Naturwissenschaftliche_Fakultaet/Psychologie/AAP/gpower/GPower3-BRM-Paper.pdf

Fullwood, C., Quinn, S., Chen-Wilson, J., Chadwick, D., & K. (2015). Put on a smiley face: Textspeak and personality percpeptions. *Cyberpsychology, Behavior, and Social Networking, 18*(3), 147-151. doi: 10.1089/cyber.2014.0463

Gill, A. J., Oberlander, J., & Austin, E. (2006). Rating e-mail personality at zero acquaintance. *Personality and Individual Differences, 40*(3), 497-507. doi:https://doi.org/10.1016/j.paid.2005.06.027

Grace, A., Kemp, N., Martin, F. H., & Parrila, R. (2012). Undergraduates' use of text messaging language: Effects of country and collection method. *Writing Systems Research, 4,* 167-184. doi: 10.1080/17586801.2012.712875

Grace, A., Kemp, N., Martin, F. H., & Parrila, R. (2015). Undergraduates' attitudes to text messaging language use and intrusions of textisms into formal writing. *new media & society, 17*(5), 792-809. doi:10.1177/1461444813516832

Grieve, R. (2017). Unpacking the characteristics of Snapchat users: A preliminary investigation and an agenda for future research. *Computers in Human Behavior, 74,* 130-138. doi: 10.1016/j.chb.2017.04.032

Hancock, J., & J. Dunham, P. (2001). Impression formation in computer-mediated communication revisited: An analysis of the breadth and intensity of

impressions, *Communication Research, 28*(3), 325-347. doi:10.1177/009365001028003004

Huynh, H., & Feldt, L. S. (1976). Estimation of the box correction for degrees of freedom from sample data in randomized block and split-plot designs. *Journal of Educational Statistics, 1*(1), 69-82. doi: 10.3102/10769986001001069

Jessmer, S. L., & Anderson, D. (2001). The effect of politeness and grammar on user perceptions of electronic mail. *North American Journal of Psychology, 3*(2), 331-346. Retrieved from http://mydba.lagrana.net/articles/09/ART09.pdf

Kaye, L. K., Malone, S. A., & Wall, H. J. (2017). Emojis: Insights, affordances, and possibilities for psychological science. *Trends in Cognitive Sciences, 21*(2), 66-68. doi:10.1016/j.tics.2016.10.007

Kemp, N., & Clayton, J. (2016). University students vary their use of textese in digital messages to suit the recipient. *Journal of Research in Reading*, doi:10.1111/1467-9817.12074

Kemp, N., & Grace, A. (2017). Txting across time: Undergraduates' use of 'textese' in seven consecutive first-year psychology cohorts. *Writing Systems Research*, 1-17. doi:10.1080/17586801.2017.1285220

Kemp, N., Wood, C., & Waldron, S. (2014). do i know its wrong: children's and adults' use of unconventional grammar in text messaging. *Reading and Writing, 27*(9), 1585-1602. doi:10.1007/s11145-014-9508-1

Keppel, G., & Wickens, T. D. (2004). *Design and analysis: A researcher's handbook.* Upper Saddle River, New Jersey: Pearson Prentice Hall.

Kincaid, J. P., Fishburne, R. P., Jr, Rogers, R. L., & Chissom, B. S. (1975).

Derivation of new readability formulas (Automated readability index, fog count and flesch reading ease formula) for navy-enlisted personnel. (Research Branch Report 8-75). Millington, TN: Naval Technical Training, U.S. Naval Air Station; Memphis, Tennessee

Krosnick, J. A., & Presser, S. (2010). Question and questionnaire design. *Handbook of survey research, 2,* 263-314. Retrieved from http://courses.ischool.berkeley.edu/i271b/f12/readings/2010HandbookSurveyResearch.pdf

Lea, M., & Spears, R. (1992). Paralanguage and social perception in computer-mediated communication. *Journal of Organizational Computing, 2*(3-4), 321-341. doi:10.1080/10919399209540190

Lenhart, A., Arafeh, S., Smith, A., & Macgill, A. (2008). *Writing, technology and teens*. Retrieved from http://www.pewinternet.org/2008/04/24/writing-technology-and-teens/#fn-656-1

Lenhart, A., Duggan, M., Perrin, A., Stepler, R., Rainie, L., & Parker, K. (2015a). *Teens, social media & technology overview 2015*. Retrieved from http://www.pewinternet.org/2015/04/09/teens-social-media-technology-2015/

Lenhart, A., Smith, A., Anderson, M., Duggan, M., & Perrin, A. (2015b). *Teens, technology and friendships*. Retrieved from http://www.pewinternet.org/2015/08/06/teens-technology-and-friendships/

Lewandowski, G., & Harrington, S. (2006). The influence of phonetic abbreviations on evaluation of student performance. *Current Research in Social Psychology, 11*(15), 215-226. Retrieved from https://pdfs.semanticscholar.org/096e/b328ecbb6f97a8686f171e47cbfa601c1919.pdf

Lewis, C., & Fabos, B. (2005). Instant messaging, literacies, and social identities. *Reading Research Quarterly, 40*(4), 470-501. doi:10.1598/RRQ.40.4.5

Liu, Y. C., Lin, C., & Huang, Y. (2012). An exploration of communicating with textspeak: A social presence perspective. *The International Technology Management Review, 3*(1), 54-59. Retrieved from http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.933.2393&rep=rep1&type=pdf

Lyddy, F., Farina, F., Hanney, J., Farrell, L., & Kelly O'Neill, N. (2014). An analysis of language in university students' text messages. *Journal of Computer-Mediated Communication, 19*(3), 546-561. doi:10.1111/jcc4.12045

Nielsen (2017). *Mobile kids: The parent, the child and the smartphone*. Retrieved from http://www.nielsen.com/us/en/insights/news/2017/mobile-kids--the-parent-the-child-and-the-smartphone.html

Plester, B., Wood, C., & Joshi, P. (2009). Exploring the relationship between children's knowledge of text message abbreviations and school literacy outcomes. *British Journal of Developmental Psychology, 27*(1), 145-161. doi:10.1348/026151008X320507

Portio Research (2014). *Understanding and analysis of application-to-person text messaging markets worldwide.* Retrieved from http://www.xconnect.net/wp-content/uploads/worldwide-sms-markets-portio-strikeiron.pdf

Rosen, L. D., Chang, J., Erwin, L., Carrier, L. M., & Cheever, N. A. (2010). The relationship between “textisms” and formal and informal writing among young adults. *Communication Research, 37*(3), 420-440. doi:10.1177/0093650210362465

Roy Morgan Research (2016). *9 in 10 Aussie teens now have a mobile (and most are already on to their second or subsequent handset*. (Article No. 6929). Retrieved from http://www.roymorgan.com/findings/6929-australian-teenagers-and-their-mobile-phones-june-2016-201608220922

Turner, K. H., Abrams, S. S., Katic, E., & Donovan, M. J. (2014). Demystifying digitalk: The what and why of the language teens use in digital writing. *Journal of Literacy Research, 46*(2), 157-193. doi:10.1177/1086296X14534061

Vignovic, J. A., & Thompson, L. F. (2010). Computer-mediated cross-cultural collaboration: Attributing communication errors to the person versus the situation. *Journal of Applied Psychology, 95*(2), 265-276. doi: 10.1037/a0018628

Appendix A: UTAS Human Research Ethics Committee Approval

Dear Dr Kemp

Ethics Ref: H0013925
Title: How the language of digital communication affects recipients

This email is to confirm that the following amendment was approved by the Chair of the Tasmania Social Sciences Human Research Ethics Committee on 28/4/2017:

- Addition of Honours students Lucy Gillespie and Jessica Graham.
- Removal of completed Honours student Mark Morgan.
- Remove tasks of spelling, empathic concern and personality type.
- Add rating scales: for high school students, ask them to rate the fictitious message senders on the perceived appropriateness of their language use.
- Remove collection of own messages: for high school students.
- Photograph text messages: for primary school students.
- Data collected by pen and paper task, not online task: for primary school students.
- Focus only on responses of children, not teachers as well.
- Revised Information Sheets and Consent Forms for Primary School Students.
- Revised Information Sheets and Consent Forms for High School Students.

All committees operating under the Human Research Ethics Committee (Tasmania) Network are registered and required to comply with the National Statement on Ethical Conduct in Human Research (NHMRC 2007, updated May 2015).

This email constitutes official approval. If your circumstances require a formal letter of amendment approval, please let us know.

Should you have any queries please do not hesitate to contact me.

Kind regards
Katherine

Katherine Shaw
Executive Officer, Social Sciences HREC
Office of Research Services | Research Division
University of Tasmania
Private Bag 1
Hobart TAS 7001
T +61 3 6226 2763
[www.utas.edu.au/research]www.utas.edu.au/research

UNIVERSITY of TASMANIA

CRICOS 00586B

Appendix B: Catholic Education Office Approval

Dear Jessica,

Thank you for forwarding to the Tasmanian Catholic Education Office your Research Application Form.

The purpose of this email is to formally advise you that your Research Application to conduct a small research project at MacKillop Catholic College as part of the larger ongoing overall project by UTAS has been approved.

The whole question of how young people write and respond to digital messages is certainly important, and so I anticipate your Honours project will surely contribute to the body of knowledge in this area.

Normally I advise that the conduct of the on-site research also required the endorsement of the Principal, but I note that you have already been in contact with Deborah Arnett (Director L&T) and with Eamonn Pollard, the Principal, who you indicate are keen for the College to participate.

Thank you once again for your application. I wish you well in the conduct of your project.

Kind regards,
Tom

Tom Dorey
Executive Officer - Directorate and Governing Councils
Tasmanian Catholic Education Office
5 Emmett Place | New Town | 7008
PO Box 102 | North Hobart | 7002

T (03) 6210 8888
F (03) 6210 8844
W catholic.tas.edu.au

The Tasmanian Catholic Education Office acknowledges the traditional owners of country throughout Tasmania and their continuing connection to land, sea and community. We pay our respect to them and their cultures, and to the elders past and present.

Appendix C: Participant Information Sheets and Consent Forms (Students, Parents of Students, and Principals)

Information Sheet for School Students (June 2017)

What school students think about writing in emails and text messages

You are invited to help with our research on how school students respond to digital messages, like emails and text messages. If you decide to help with this research, you will be answering some questions on a computer, and the researcher, Jess Graham, will be helping you if you get stuck.

You will be asked to answer some questions about your age and how often you write digital messages, but you won't have to write down your name, so no one will know which answers are yours.

Jess will show you some messages that other (pretend) people have written. You will get to give your opinion about these people after you read their messages, on the computer.

We will be pleased if you would like to be in our study. If you decide to be in the study, you can start the questions now.

But if you don't want to do it, or if you start and then want to stop, you can just say so. You don't need to tell us why.
Thank you for your help!

Nenagh Kemp Jess Graham

Information Sheet for Parents of School Student Participants (June 2017)

How the language of digital communication affects recipients

Invitation
Duz ur child write txts?! Your child is invited to participate in a research survey examining how children respond to digital communication such as emails and text messages. This study is being conducted by Jess Graham as part of the Honours program in Psychology at the University of Tasmania, and is being supervised by Dr. Nenagh Kemp.

What is the purpose of this study?
More and more children are using text-messaging and other forms of digital communication. There is some evidence suggesting that the way in which a message is written can influence the way people respond to the message writer. The purpose of this study is to see how children respond when they see messages written by different people in different ways.

Why has my child been invited to participate?
The school is sending this invitation, on the researchers' behalf, to parents of all children in Grade 8 at your school. They don't need to use text-messaging or emails to take part.

What will my child be asked to do?
If you and your child agree that your child can participate, your child will complete the survey on a computer at the school, in a small group, with Honours student Jess Graham. Children will answer the questions themselves, with help from Jess, and the task will last about 20 minutes. They will not need to provide their names in the survey. They will be asked some questions about their use of digital communication (e.g., if/how often they write text messages), and they will be shown some messages written by other (fictional) people, that are written in correct English, or with text-style abbreviations, and asked to give their opinions of the message writers.

Are there any possible benefits from participation in this study?
Many children find it interesting to think about the different ways that people write words in different types of messages. More generally, this study will provide useful evidence about whether children form different impressions about message writers, depending on whom the message is written to, and depending on what style the message is written in.

Are there any possible risks from participation in this study?
There are no specific risks associated with taking part in this study.

What if my child changes his or her mind during or after the study?

If your child decides not to continue with the study once it's started, he or she can stop at any time, without needing to provide an explanation. If you or your child wished to withdraw at a later date, however, the individual data will no longer be identifiable, and so we won't be able to delete it.

What will happen to the information when this study is over?
The data will be collected using a secure online service. Once the data is transferred for analysis, it will be stored on a password-protected server in the School of Psychology. Research data will be kept for at least 5 years after publication, but will then be deleted.

How will the results of the study be published?
We will send a summary of the results of this study to the Principal to let parents know what we found. The findings of this study will also be written up in a thesis as a part of Jess Graham's Honours degree, and eventually in a scientific journal article. Your child and school will not be identifiable in the publication of the results.

What if I have questions about this study?
Please do not hesitate to contact Dr. Nenagh Kemp via email at nenagh.kemp@utas.edu.au or by phone on 6226 7534 or Jess Graham via email at jgraham4@utas.edu.au if you would like to discuss any aspect of this study.

This study has been approved by the Tasmanian Social Sciences Human Research Ethics Committee. If you have concerns or complaints about the conduct of this study, please contact the Executive Officer of the HREC (Tasmania) Network on (03) 6226 7479 or email human.ethics@utas.edu.au. The Executive Officer is the person nominated to receive complaints from research participants. Please quote ethics reference number H13925.

You can keep this Information sheet. If you consent for your child to participate, please sign and return the attached statement of Informed Consent to the school.

Dr. Nenagh Kemp
Chief Investigator

Jess Graham
Student Investigator

Consent Form for Parents of School Student Participants (June 2017)

How the language of digital communication affects recipients

1. I agree for my child to take part in the research survey named above, if he/she agrees.
2. I have read and understood the Information Sheet for this study.
3. The nature and possible effects of the study have been explained to me.
4. I understand that the study involves my child being helped to fill in a survey on their use of digital communication and giving their opinions about some made-up people who have written some messages.
5. I understand that participation does not involve any foreseeable risks.
6. I understand that all research data will be securely stored on the University of Tasmania premises for five years from the publication of the study results, and will then be deleted.
7. Any questions that I have asked have been answered to my satisfaction.
8. I understand that the researchers will maintain confidentiality and that any information my child supplies to the researchers will be used only for the purposes of the research.
9. I understand that the results of the study will be published so that my child cannot be identified as a participant.
10. I understand that my child's participation is voluntary and that I may withdraw him or her at any time without any consequence.

Child's name: _____
Parent's name: _____
Parent's signature: _____
Date: _____

Statement by Investigator

☐ Via the enclosed Information Sheet and Consent Form, I have explained the project and the implications of participation in it to this parent and I believe that the consent is informed and that he/she understands the implications of participation.

Investigator's name: _____
Investigator's signature: _____
Date: _____

Information Sheet for School Principal (June 2017)
How the language of digital communication affects recipients

Invitation
We would like to invite Grade 8 students at your school to participate in a research survey examining the way that children respond to digital communication such as text messages and emails. This study is being conducted by Jess Graham as part of the Honours program in Psychology at the University of Tasmania, and is being supervised by Dr. Nenagh Kemp.

What is the purpose of this study?
Many children now regularly use text messaging and other forms of digital communication. There is some evidence suggesting that the way in which a message is written can influence the way people respond to the message writer. The purpose of this study is to see how school students respond to messages that are sent to different people, and written in different ways.

Why has my school been invited to participate?
We have been looking at how university students use digital communication, but it is also important to look at how this form of writing is responded to by children.

What will children be asked to do?
If your school decides to take part, we will first obtain permission from parents and children to participate. Honours student Jess Graham will work with children individually or in small groups (whichever works best for the school) for about 20 minutes to help them complete an online survey, either on her laptop (individually) or on school computers (in a small group). Children will not need to provide their names, but will be asked some questions about their use of digital communication (e.g., if/how often they write text messages), and shown some messages written by other (fictional) people, that are written in correct English, or with text-style abbreviations, and asked to give their opinions of the message writers.

What would the school's participation involve?
Participation would involve distributing information and consent letters to all students in Grade 8 to take home to their parents or guardians. A small insertion in the school newsletter would also be helpful in explaining the study to parents. We would like students to be able to take part in the study in any appropriate room in the school, at times arranged with school staff.

Are there any possible benefits from participation in this study?
Many children find it interesting to think about the different ways that people write words in different types of messages. More generally, as more children are exposed to text-message style spellings, parents and teachers have begun to wonder if this might affect their spelling. This study will provide useful evidence about whether

children form different impressions about message writers, depending on whom the message is written to, and depending on what style the message is written in.

Are there any possible risks from participation in this study?
There are no specific risks associated with taking part in this study.

What if a student changes his or her mind during or after the study?
If a student decides not to continue with the survey once it's started, he or she can stop at any time, without needing to provide an explanation. If they wished to withdraw at a later date, however, the individual data will no longer be identifiable, and so we won't be able to delete it.

What will happen to the information when this study is over?
The survey responses will be kept for five years after publication. When this period is over, the files will be deleted. All data will be kept on password-protected computers of the researchers. The data will be kept entirely confidential.

How will the results of the study be published?
We will send the school a summary of the results of this study to let teachers and parents know what we found. We are also happy to come in and talk about the results if you would like. The findings of this study will be written up in a thesis as a part of Jess Graham's Honours degree. We will also aim to publish the results in an academic journal article. No participant or school will be identifiable in any publication of the results.

What if I have questions about this study?
Please do not hesitate to contact Dr. Nenagh Kemp via email at nenagh.kemp@utas.edu.au or by phone on 6226 7534 or Jess Graham via email at jgraham4@utas.edu.au if you would like to discuss any aspect of this study.
This study has been approved by the Tasmanian Social Sciences Human Research Ethics Committee. If you have concerns or complaints about the conduct of this study, please contact the Executive Officer of the HREC (Tasmania) Network on (03) 6226 7479 or email human.ethics@utas.edu.au. The Executive Officer is the person nominated to receive complaints from research participants. Please quote ethics reference number H13925.

You will receive a copy of this Information sheet, and of the statement of Informed Consent. One copy of the Consent form should be signed for the investigator, and one will be given to you to keep for your own records. Thank you for considering this study.

Dr. Nenagh Kemp
Chief Investigator

Jess Graham
Student Investigator

Consent Form for School Principal (June 2017)
How the language of digital communication affects recipients

1. I agree for my school to be involved in the research study named above.
2. I have read and understood the Information Sheet for this study.
3. The nature and possible effects of the study have been explained to me.
4. I understand that the study involves understand that the study involves children in Grade 8 being helped to fill in a survey on their use of digital communication, and giving their opinions about some made-up people who have written some messages.
5. I understand that participation does not involve any foreseeable risks.
6. I understand that all research data will be securely stored on the University of Tasmania premises for five years from the publication of the study results, and will then be destroyed.
7. Any questions that I have asked have been answered to my satisfaction.
8. I understand that the researchers will maintain confidentiality and that any information participants supply to the researchers will be used only for the purposes of the research.
9. I understand that the results of the study will be published so that participants cannot be identified as a participant.
10. I understand that all participation is voluntary and that participants may withdraw at any time without any consequence.

School name: _____
Principal's name: _____
Principal's signature: _____
Date: _____

Statement by Investigator

☐ Via the enclosed Information Sheet and Consent Form, I have explained the project and the implications of participation in it to this principal and I believe that the consent is informed and that he/she understands the implications of participation.

Investigator's name: _____
Investigator's signature: _____
Date: _____

Appendix D: Digital Communication Questionnaire

Q1. What is your age, in years? _____

Q2. What is your current grade at school? _____

Q3. What is your gender?

- Male
- Female
- Prefer not to answer

Q4. Do you send and receive all of your text messages in English?

- Yes
- No
- If no, what percentage of these messages are in English? _____

Q5. Do you send and receive all of your emails in English?

- Yes
- No
- If no, what percentage of these messages are in English? _____

Q6. On average, how many messages do you send and receive, per day, for the following types of communication?

- Text messages: send _____
- Text messages: receive _____
- Email messages: send _____
- Email messages: receive _____

Q7. Approximately how long have you been sending messages in the following types of communication (in years)?

- Text messages _____
- Email messages _____

Q8. What type of keypad does your current mobile phone have?

- Alpha-numeric (letters written above number keys, like on a landline phone)
- Qwerty keypad (letters, numbers and symbols all on the one board, like on a computer keyboard)
- Qwerty touch-screen keypad (separate touch-screens for letters, numbers and symbols, like on an iPhone)
- Other (please explain) _____

Q9. When you send and receive emails, how do you usually access them?

- Mostly by computer
- Mostly by mobile phone
- About equally on mobile phone and computer

Q10. Do you usually use predictive text on your mobile phone?

- Yes
- No
- Sometimes

Please note: As participants completed this questionnaire online, the presentation formatting was slightly different.

Appendix E: Message Response Task Presented Messages

Table E1

Version 1 of the Message Response Task Presented Messages with Corresponding Textese Densities, Modalities and Recipients

Textese density	Modality	Recipient	Presented message
Low	Text	Friend	Hi Ella, /I'm sorry that my phone rang during your talk in class today. I didn't realise that it would be so loud - I hope it wasn't too much of a disruption! I'll remember to put it on silent next time. /Sorry again, /Matt
		Teacher	Hi Mr Jones, /Remember how you liked that cake I brought for morning tea on Friday? I've just written the recipe out, and I'll bring it to school tomorrow. It's a really easy recipe! /See you tomorrow, /Emma
	Email	Friend	Hi Sarah, /I'm looking forward to the afternoon tea at school tomorrow, but I just wanted to tell you that I'm allergic to nuts. Mrs Brown said that I should let you know. /See you tomorrow afternoon, /Hannah
		Teacher	Hi Mr Norman, /I just wanted to thank you for helping me when I fell over at school this afternoon. I would've been late for my next class, so it was really kind of you to pick up my books after they went everywhere! /Thanks again, /Chloe
Medium	Text	Friend	Hi Ben, /Thanks a lot for ur help with my English homework on wednesday morning. i understand the question so much more now, and i definitely think i can get a good mark on it! /Lauren
		Teacher	Hi Mr Lennard, /Thank you for saying i could borrow your maths textbook on thursday afternoon. I just wanted to check that it was still okay? i'll meet u outside the library tomorrow morning before class to

			pick it up. /See u then, /Ryan
	Email	Friend	Hi Georgia, /Im going to be late to the student council meeting on tuesday morning. i forgot i had a dentist appt at 8am, so I'll probably be about 15 or 20 minutes late. please let me know if i miss anything important! /Thanks, /Sophie
		Teacher	Hi Mrs Odgers, /I hope u enjoy reading the book i lent you. Mum bought it for me last friday and i read it in 2 days, because it was so good! I dont mind how long u have it for by the way. /Charlotte
High	Text	Friend	Hi luke, /Im not gonna be able to make it to cricket training on wednesday arvo. ive got a doctor's appt, and i wasnt able to change the time. i'll defs be there next week though!!! /Josh
		Teacher	Hi mrs everton, /i know ur reallllly busy, so plz dont worry about reading my essay before class on mon. mr johnson said he could hve a look at it coz he has some spare time. thanks for the offer tho!!! /Daniel
	Email	Friend	hi maddy, /Im sorry i didnt reply to ur question sooner. Ive been sick this past week and havent checked my msgs. but yes, i would like to help with the morning tea at school next thurs! /see ya at school, /Sam
		Teacher	Hi mr jackson, /my mum said that she could help out with ur stall at the fair this wkend. shes free in the morn before 12 on saturday. but shes busy in the arvo. /i hope it goes well, /Ethan

Please Note: Slashes, /, represent line breaks.

Table E2

Version 2 of the Message Response Task Presented Messages with

Corresponding Textese Densities, Modalities and Recipients

Textese density	Modality	Recipient	Presented message
Low	Text	Friend	Hi Noah, /I just wanted to thank you for helping me when I fell over at school this afternoon. I would've been late for my next class, so it was really kind of you to pick up my books after they went everywhere! /Thanks again, /Chloe
		Teacher	Hi Mr Burton, /Thanks a lot for your help with my English homework on Wednesday morning. I understand the question so much more now, and I definitely think I can get a good mark on it! /Lauren
	Email	Friend	Hi Liam, /Thank you for saying I could borrow your Maths textbook on Thursday afternoon. I just wanted to check that it was still okay? I'll meet you outside the library tomorrow morning before class to pick it up. /See you then, /Ryan
		Teacher	Hi Mrs George, /I'm going to be late to the student council meeting on Tuesday morning. I forgot I had a dentist appointment at 8am, so I'll probably be about 15 or 20 minutes late. Please let me know if I miss anything important! /Thanks, /Sophie
Medium	Text	Friend	Hi Olivia, /I hope u enjoy reading the book i lent you. Mum bought it for me last friday and i read it in 2 days, because it was so good! I dont mind how long u have it for by the way. /Charlotte
		Teacher	Hi Mr Lucas, /Im not going to be able to make it to cricket training on wednesday afternoon. Ive got a doctor's appt, and i wasn't able to change the time. i'll definitely be there next week though! /Josh

	Email	Friend	Hi Emily, /I know ur really busy, so please dont worry about reading my essay before class on monday. Mr johnson said he could have a look at it because he has some spare time. thanks for the offer tho! /Daniel
		Teacher	Hi Mrs Mason, /Im sorry i didn't reply to your question sooner. Ive been sick this past week and haven't checked my messages. But yes, i would like to help with the morning tea at school next thursday! /see you at school, /Sam
High	Text	Friend	Hi jack, /my mum said that she could help out with ur stall at the fair this wkend. shes free in the morn before 12 on saturday. but shes busy in the arvo. /i hope it goes well, /Ethan
		Teacher	hi mrs ellis, /im sorry that my phone rang during ur talk in class today. i didnt realise that it would be sooo loud - i hope it wasnt too much of a disruption!!! ill remember to put it on silent nxt time. /sorry again, /matt
	Email	Friend	Hi james, /remember how u liked that cake i brought for morning tea on friday??? ive just written the recipe out, and i'll bring it 2 school tomorrow. its a really easy recipe! /See u tomorrow, /Emma
		Teacher	hi mrs sanderson, /im looking forward to the afternoon tea at school tomorrow, but i just wanted to tell u that im allergic to nuts. Mrs brown said that i should let u know. /See u tomorrow arvo, /Hannah

Please Note: Slashes, /, represent line breaks.

Table E3

Version 3 of the Message Response Task Presented Messages with Corresponding Textese Densities, Modalities and Recipients

Textese density	Modality	Recipient	Presented message
Low	Text	Friend	Hi Georgia, /I'm going to be late to the student council meeting on Tuesday morning. I forgot I had a dentist appointment at 8am, so I'll probably be about 15 or 20 minutes late. Please let me know if I miss anything important! /Thanks, /Sophie
		Teacher	Hi Mrs Odgers, /I hope you enjoy reading the book I lent you. Mum bought it for me last Friday and I read it in two days, because it was so good! I don't mind how long you have it for by the way. /Charlotte
	Email	Friend	Hi Luke, /I'm not going to be able to make it to cricket training on Wednesday afternoon. I've got a doctor's appointment, and I wasn't able to change the time. I'll definitely be there next week though! /Josh
		Teacher	Hi Mrs Everton, /I know you're really busy, so please don't worry about reading my essay before class on Monday. Mr Johnson said he could have a look at it because he has some spare time. Thanks for the offer though! /Daniel
Medium	Text	Friend	Hi Maddy, /Im sorry i didn't reply to your question sooner. Ive been sick this past week and haven't checked my messages. But yes, i would like to help with the morning tea at school next thursday! /see you at school, /Sam
		Teacher	Hi Mr Jackson, /My mum said that she could help out with ur stall at the fair this weekend. she's free in the morning before 12 on saturday. but she's busy in the arvo. /I hope it goes well, /Ethan

	Email	Friend	Hi Ella, /Im sorry that my phone rang during ur talk in class today. i didnt realise that it would be so loud - i hope it wasn't too much of a disruption! i'll remember to put it on silent next time. /sorry again, /Matt
		Teacher	Hi Mr Jones, /Remember how u liked that cake I brought for morning tea on friday? i've just written the recipe out, and i'll bring it to school tomorrow. it's a really easy recipe! /See u tomorrow, /Emma
High	Text	Friend	hi sarah, /im looking forward to the afternoon tea at school tomorrow, but i just wanted to tell u that im allergic to nuts. Mrs brown said that i should let u know. /See u tomorrow arvo, /Hannah
		Teacher	hi mr norman, /i just wanted 2 thank u for helping me when i fell over at school this arvo. i wouldve been late 4 my next class, so it was reallllllly kind of u to pick up my books after they went everywhere!!! /thanks again, /chloe
	Email	Friend	Hi ben, /thanks a lot for ur help with my english homework on wed morn. i understand the question soooo much more now, and i defs think i can get a good mark on it!!! /Lauren
		Teacher	Hi mr lennard, /thank u for saying i could borrow ur maths textbook on thursday arvo. i just wanted to check that it was still okay??? ill meet u outside the library tomorrow morn before class to pick it up. /See u then, /Ryan

Please Note: Slashes, /, represent line breaks.